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ALEJANDRO, RAYMOND	
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SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/034,901	CINTRA ET AL.	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *53,54,56,58,59,63-65,73 and 76-79* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *53,54,56,58,59,63-65,73 and 76-79* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/16/07 has been entered.

This correspondence is submitted in response to the amendment filed in connection with the foregoing RCE. None of the prior art rejections have been satisfactorily overcome by the applicant. Refer to the above-referenced amendment for substance of applicant's rebuttal arguments and/or remarks. Therefore, the present claims are again rejected over the previously stated grounds of rejection as presented hereunder and for the reasons of record:

Claim Disposition

1. Claims 55, 57 and 72 have also been cancelled; and claims 77-79 are new.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 79 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 79 recites the limitation "*the first cathode mixture*" in line 4 [see step (c)]. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 79 recites the limitation "a first cathode mixture" in line 5 [see step (d)]. There is insufficient antecedent basis for this limitation in the claim. Note that line 4 (step (c) contains an earlier recitation of that limitation.

6. Claim 79 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: step (a) blends a first binder and a first solvent; step (b) blends a first electrode active material and a conductive aid; thereafter, step (c) combines the blend of step (a) and (b); and later on step (d), inter alia, provides a first cathode layer including at least the first electrode active material and the first binder. If the conductive aid is to be present, then it has been positively omitted from the final cathode mixture; ***OR***

Claim 79 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: step (a) blends a first binder and a first solvent; step (b) blends a first electrode active material and a conductive aid; thereafter, step (c) combines the blend of step (a) and (b); and later on step (d), inter alia, provides a first cathode layer including at least the first electrode active material and the first binder. If the conductive aid is not to be present, then a step removing the conductive aid has been positively omitted in applicant's method.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 53, 58-59, 63-64 and 76 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chu 5582623.

The instant application is directed to a method of making a battery electrode wherein the disclosed inventive concept comprises forming a cathode layer and removing the substrate. Other

limitations include the cathode mixture; the substrate material; the current collector; the binder and the continuous process.

As to claim 76 and 63:

Chu discloses methods of fabricating rechargeable positive electrodes (TITLE) including the step of forming the active electrode involving a step of depositing a layer of an electrode mixture on a substrate (COL 7, lines 21-30); and when a slurry is employed to prepare the electrode, a further step of drying is employed to dry the electrode; the slurry may be dried on a substrate (COL 7, lines 32-35); the dried electrode must be first removed from the substrate, and then affixed to a current collector (COL 7, lines 36-40). Chu clearly discloses that after the electrode film is dried, it is peeled away from the substrate and later contacted to a current collector (COL 14, lines 40-45). Chu directly discloses that the dried electrode must be first removed from the substrate, and then affixed to a current collector (COL 7, lines 37-40).

The positive electrode is a composite matrix (a mixture) including active material (COL 10, lines 32-45) and binders (COL 11, l9ines 60-65); and solvents (COL 12, lines 20-30).

EXAMPLE 1 illustrates the making of the positive electrode film comprising mixing the active material, carbon black (*the conducting agent*); a polymeric material (*which may act as the binder*) in a solution (*encompassing the solvent*). *Thus, Chu discloses with sufficient specificity the specific method of making the battery electrode as instantly claimed.*

Chu employs a solvent (COL 12, lines 20-30). **EXAMPLE 1** illustrates the making of the positive electrode film comprising mixing the active material, carbon black (*the conducting agent*); a polymeric material (*which may act as the binder*) in a solution (*encompassing the solvent*).

(*1st Emphasis added→*) Chu discloses that it should be noted that electrodes of appropriate thickness for low power application may be made by laminating two or more thinner electrodes (COL 14, lines 27-30). *Thus, not only Chu at once envisages laminating two or more layers, but Chu also provides specific guidance for forming more than one electrode layer as instantly claimed. Thus, Chu's teachings at least do encompass forming a first stack comprising more than one electrode layer regardless of the specific step order.*

Chu discloses methods of fabricating rechargeable positive electrodes (TITLE) including the step of forming the active electrode involving a step of depositing a layer of an electrode mixture on a substrate (COL 7, lines 21-30). (***Emphasis added→***) Chu discloses that it should be noted that electrodes of appropriate thickness for low power application may be made by laminating two or more thinner electrodes (COL 14, lines 27-30). *Thus, not only Chu at once envisages laminating two or more layers, but Chu also provides specific guidance for forming more than one electrode layer as instantly claimed. Thus, Chu's teachings at least do encompass forming a first stack comprising more than one electrode layer regardless of the specific step order.*

Chu employs a solvent (COL 12, lines 20-30). **EXAMPLE 1** illustrates the making of the positive electrode film comprising mixing the active material, carbon black (*the conducting agent*); a polymeric material (*which may act as the binder*) in a solution (*encompassing the solvent*).

(*2nd Emphasis supplied→*) Chu discloses that preferred liquid solvents evaporate quickly so that the resulting film dries completely and before the redistribution of the components can

occur (COL 12, lines 25-30). *Thus, Chu's teachings encompass removing a portion of the solvent.*

Examiner's Note: *in this case, the step of "removing only a portion of the first or second solvent after coating the first or second cathode mixture" is deemed to be an inherent step of the process of making the cathode of Chu. The statement of inherency is based upon the fact that it is known in the art that solvents used in Chu's process are highly volatile solvents, and this means that portions of Chu's solvents are necessarily removed from the cathode mixture little-by-little. Note that statement of inherency is not grounded on whether or not the totality of the solvent is removed at some point during the process; or whether or not the totality of the solvent is removed at the end of the process, rather the statement of inherency focuses mainly on the fact that: i) a volatile substance (i.e. the claimed solvent) is readily vaporizable at a relative low temperature, thereby becoming difficult to capture or hold permanently, and ii) the claim requirement of removing "only a portion" (the specific connotation of "only a portion"). Stated differently, the combination of the claim language "only a portion" along with the well-known characteristic of a solvent (volatile substance) supports the inherency statement that portions of the solvent are necessarily removed during the making of Chu's cathode.*

MPEP 2112 establishes the following: *V. ONCE A REFERENCE TEACHING PRODUCT APPEARING TO BE SUBSTANTIALLY IDENTICAL IS MADE THE BASIS OF A REJECTION, AND THE EXAMINER PRESENTS EVIDENCE OR REASONING TENDING TO SHOW INHERENCY, THE BURDEN SHIFTS TO THE APPLICANT TO SHOW AN UNOBVIOUS DIFFERENCE "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed*

product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

As to claim 53:

Chu discloses adding binders (COL 11, lines57-65) and the use of various polymeric materials (COL 10, lines 35-65 & COL 11, lines 33-55). *It is noted that any of these polymeric materials is capable of binding together the electrode components.*

As to claims 58-59:

Disclosed is the addition of conducting agents such as carbon black into the cathode mixture (COL 11, lines 50-57). **EXAMPLE 1** shows the use of carbon black (EXAMPLE 1).

As to claim 64:

Chu directly discloses that the dried electrode must be first removed from the substrate, and then affixed to a current collector (COL 7, lines 37-40).

All the process limitations were expressly disclosed by Chu except the specific step of "removing only a portion of the first/second solvent", therefore, the undisclosed removal of only a portion of the solvents is inherent based on Chu's method and the knowledge generally available in the art that solvents are volatile substances (See Examiner's Note supra). The court has stated that a prima facie case under 35 U.S.C. 102 /103 can be made. In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977) and Ex parte Novitski, 26 USPQ2d 1389 (Bd. Pat. App. & Inter. 1993). The burden of proof is on applicant In re Fitzgerald, 619 F.2d 67, 70,

205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)). ***See MPEP 2112.***

Therefore, the present claims are anticipated by Chu. However, if the claims are not anticipated the claims are obvious as it has been held similar products or processes claimed in terms of its function, property and/or characteristic are obvious. *In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); Ex parte Novitski, 26 USPQ2d 1389 (Bd. Pat. App. & Inter. 1993); and In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980). See rationale and/or technical reason above to reasonably support the determination that the inherent function and/or characteristic necessarily flows from the teaching of the applied prior art.*

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 54 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu 5582623 as applied to claims 76 above, and further in view of Hamamoto et al 2002/0168576.

Chu is applied, argued and incorporated herein for the reasons above. However, the preceding reference does not expressly disclose the specific binder and solvent; and the specific electrode active material.

As to claims 54, 56:

Hamamoto et al disclose that cathode can be prepared by mixing the cathode active material with a conducting agent, a binder such as polyvinylidene fluoride (PVDF), polytetrafluoroethylene (PTFE); and N-methylpyrrolidone solvent to form a cathode paste which is coated on a collector (*the substrate*) (SECTION 0043, 0044, 0062). **EXAMPLE 1** exemplifies mixing such specific electrode components to form the cathode paste (EXAMPLE 1).

[0043] The cathode can be prepared by mixing the cathode active material with a conductive agent such as acetylene black or carbon black, a binder such as polyvinylidene fluoride (PVDF), polytetrafluoroethylene (PTFE), and N-methylpyrrolidone solvent to form a cathode paste, then coating this cathode paste on a collector such as aluminum foil or a stainless steel lath, drying at 50 to 250° C., followed by compression molding.

[0062] 80% by weight of $LiCoO_2$ (cathode active material), 10% by weight of acetylene black (conductive agent), and 10% by weight of polyvinylidene fluoride (binder) were mixed and diluted by N-methylpyrrolidone to prepare a cathode paste. The paste was coated on an aluminum foil

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to employ the specific the specific binder and solvent of Hamamoto et al to make the battery electrode of Chu because Hamamoto et al teach that battery cathodes can be prepared by mixing together the cathode active material, conducting aids, solvents and binders. Accordingly, such specific cathode mixture materials are suitable battery electrode components

helping to provide a non-aqueous electrolyte battery having satisfactory electric capacity and superior cycle characteristics and storage characteristics.

As far as the specific electrode active material, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific electrode active material of Hamamoto et al in the method (or electrochemical cell) of Chu because Hamamoto et al teach that the specifically claimed electrode active material allows to produce compact, light and high capacity secondary batteries (P0004). Thus, such an electrode active material does increase the capacity of secondary batteries. Thus, one of ordinary skill in the art would have reasonably expected that the advantages discussed in Hamamoto et al would have also been achieved by using such a specific electrode active material in the method (or electrochemical cell) of Chu.

14. Claims 65 and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu 5582623 as applied to claim 76 above.

Chu is applied, argued and incorporated herein for the reasons discussed supra. However, Chu does not expressly disclose producing a second stack of cathode layers.

However, Chu discloses methods of fabricating rechargeable positive electrodes (TITLE) including the step of forming the active electrode involving a step of depositing a layer of an electrode mixture on a substrate (COL 7, lines 21-30). (***Emphasis added→***) Chu discloses that it should be noted that electrodes of appropriate thickness for low power application may be made by laminating two or more thinner electrodes (COL 14, lines 27-30). *Thus, not only Chu at once*

envisages laminating two or more layers, but Chu also provides specific guidance for forming more than one electrode layer as instantly claimed. Thus, Chu's teachings at least do encompass forming a first stack comprising more than one electrode layer regardless of the specific step order.

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to produce a second stack of cathode layers by using the method disclosed by Chu because it has been held that re-arrangement, reversal or duplication of parts is obvious. Succinctly stated, fact that a claimed second stack of cathode layers is structurally re-arranged, reversed or duplicated is not sufficient by itself to patentably distinguish over an otherwise old feature unless there are new or unexpected results as it is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed second stack of cathode layers was significant. In re Japikse 86 USPQ 70. In re Kuhle 188 USPQ 7. In re Gazda 104 USPQ 400. In re Harza 124 USPQ 378. (***Refer to MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale: VI. Reversal, Duplication, OR Rearrangement of Parts***).

15. Claim 73 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu 5582623.

As to claims 73 and 79:

Chu discloses methods of fabricating rechargeable positive electrodes (TITLE) including the step of forming the active electrode involving a step of depositing a layer of an electrode mixture on a substrate (COL 7, lines 21-30); and when a slurry is employed to prepare the

electrode, a further step of drying is employed to dry the electrode; the slurry may be dried on a substrate (COL 7, lines 32-35); the dried electrode must be first removed from the substrate, and then affixed to a current collector (COL 7, lines 36-40). Chu clearly discloses that after the electrode film is dried, it is peeled away from the substrate and later contacted to a current collector (COL 14, lines 40-45).

The positive electrode is a composite matrix (a mixture) including active material (COL 10, lines 32-45) and binders (COL 11, l9ines 60-65); and solvents (COL 12, lines 20-30).

(***Emphasis added→***) Chu further discloses that the exact ordering in which components are added to the slurry is not critical to the invention. In fact, as illustrated in EXAMPLES 18-20, various approaches have been found to work with his invention (COL 12, lines 50-61). In one embodiment, some components are first dissolved and mixed before other components are added; while in another exemplary embodiment, all components except one component are dispersed and dissolved (mixed) before that one component is added. It is further disclosed that components may be added to the slurry sequentially or in a premixed form (i.e. the solid insolubles are mixed before the addition to the slurry) (COL 12, lines 50-61).

EXAMPLE 1 illustrates the making of the positive electrode film comprising mixing the active material, carbon black (*the conducting agent*); a polymeric material (*which may act as the binder*) in a solution (*encompassing the solvent*). *Thus, Chu discloses with sufficient specificity the specific method of making the battery electrode as instantly claimed.*

(***Emphasis added→***) Chu discloses that it should be noted that electrodes of appropriate thickness for low power application may be made by laminating two or more thinner electrodes (COL 14, lines 27-30). *Thus, not only Chu at once envisages laminating two or more layers, but*

Chu also provides specific guidance for forming more than one electrode layer as instantly claimed. Thus, Chu's teachings at least do encompass forming a first stack comprising more than one electrode layer regardless of the specific step order.

Chu disclose a method of making a battery electrode as described above. However, Chu fails to expressly disclose the specific order of blending order as instantly claimed in claim 73 and/or 79.

However, in light of Chu's teachings, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to perform the specific blending order as instantly claimed in claim 73 because Chu itself discloses that the exact ordering in which components are added to the slurry is not critical to the invention. In fact, as illustrated in EXAMPLES 18-20, various approaches have been found to work with his invention (COL 12, lines 50-61). In one embodiment, some components are first dissolved and mixed before other components are added; while in another exemplary embodiment, all components except one component are dispersed and dissolved (mixed) before that one component is added. Chu further discloses that components may be added to the slurry sequentially or in a premixed form (i.e. the solid insolubles are mixed before the addition to the slurry) (COL 12, lines 50-61). Therefore, even though Chu does not expressly disclose the specific blending order, Chu directly exemplifies and shows that various approaches of adding components to form an electrode active material have also been found to work. Thus, Chu's teachings provide a clear instruction to those of ordinary skill in the art that changing or altering the order of adding components to form an electrode active material mixture or blending can be easily performed without critically affecting the electrode active material structure or

composition, thereby, it is well within the level of ordinary skill, and consequently, it is prima-facie obvious to do so. *Concerning this matter, it is also noted that change in sequence of adding ingredients has been held to render a prima facie case of obviousness, consequently, it is still contended that reversing the order of the prior art process steps (Ex parte Rubin 128 USPQ 440); selection of any order of performing process steps (In re Burhans 69 USPQ 330); or selection of any order of mixing ingredients (In re Gibson 5USPQ 230) are prima facie obvious in the absence of new or unexpected results* ***(See MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale: IV. Changes in Sequence of Adding Ingredients).***

16. Claims 53, 55, 57-59, 63-64 and 76-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu 5582623.

As to claim 76 and 63:

Chu discloses methods of fabricating rechargeable positive electrodes (TITLE) including the step of forming the active electrode involving a step of depositing a layer of an electrode mixture on a substrate (COL 7, lines 21-30); and when a slurry is employed to prepare the electrode, a further step of drying is employed to dry the electrode; the slurry may be dried on a substrate (COL 7, lines 32-35); the dried electrode must be first removed from the substrate, and then affixed to a current collector (COL 7, lines 36-40). Chu clearly discloses that after the electrode film is dried, it is peeled away from the substrate and later contacted to a current

collector (COL 14, lines 40-45). Chu directly discloses that the dried electrode must be first removed from the substrate, and then affixed to a current collector (COL 7, lines 37-40).

The positive electrode is a composite matrix (a mixture) including active material (COL 10, lines 32-45) and binders (COL 11, l9ines 60-65); and solvents (COL 12, lines 20-30).

EXAMPLE 1 illustrates the making of the positive electrode film comprising mixing the active material, carbon black (*the conducting agent*); a polymeric material (*which may act as the binder*) in a solution (*encompassing the solvent*). *Thus, Chu discloses with sufficient specificity the specific method of making the battery electrode as instantly claimed.*

Chu employs a solvent (COL 12, lines 20-30). **EXAMPLE 1** illustrates the making of the positive electrode film comprising mixing the active material, carbon black (*the conducting agent*); a polymeric material (*which may act as the binder*) in a solution (*encompassing the solvent*).

(***Emphasis added→***) Chu discloses that it should be noted that electrodes of appropriate thickness for low power application may be made by laminating two or more thinner electrodes (COL 14, lines 27-30). *Thus, not only Chu at once envisages laminating two or more layers, but Chu also provides specific guidance for forming more than one electrode layer as instantly claimed. Thus, Chu's teachings at least do encompass forming a first stack comprising more than one electrode layer regardless of the specific step order.*

Chu discloses methods of fabricating rechargeable positive electrodes (TITLE) including the step of forming the active electrode involving a step of depositing a layer of an electrode mixture on a substrate (COL 7, lines 21-30). (***Emphasis added→***) Chu discloses that it should be noted that electrodes of appropriate thickness for low power application may be made by

laminating two or more thinner electrodes (COL 14, lines 27-30). *Thus, not only Chu at once envisages laminating two or more layers, but Chu also provides specific guidance for forming more than one electrode layer as instantly claimed. Thus, Chu's teachings at least do encompass forming a first stack comprising more than one electrode layer regardless of the specific step order.*

As to claim 53:

Chu discloses adding binders (COL 11, lines57-65) and the use of various polymeric materials (COL 10, lines 35-65 & COL 11, lines 33-55). *It is noted that any of these polymeric materials is capable of binding together the electrode components.*

As to claim 55:

Chu employs a solvent (COL 12, lines 20-30). **EXAMPLE 1** illustrates the making of the positive electrode film comprising mixing the active material, carbon black (*the conducting agent*); a polymeric material (*which may act as the binder*) in a solution (*encompassing the solvent*).

As to claim 57:

Chu discloses that preferred liquid solvents evaporate quickly so that the resulting film dries completely and before the redistribution of the components can occur (COL 12, lines 25-30). *Thus, Chu's teachings encompass removing a portion of the solvent.*

As to claims 58-59:

Disclosed is the addition of conducting agents such as carbon black into the cathode mixture (COL 11, lines 50-57). **EXAMPLE 1** shows the use of carbon black (EXAMPLE 1).

As to claim 64:

Chu directly discloses that the dried electrode must be first removed from the substrate, and then affixed to a current collector (COL 7, lines 37-40).

As regards to claim 77:

However, Chu discloses methods of fabricating rechargeable positive electrodes (TITLE) including the step of forming the active electrode involving a step of depositing a layer of an electrode mixture on a substrate (COL 7, lines 21-30). (***Emphasis added→***) Chu discloses that it should be noted that electrodes of appropriate thickness for low power application may be made by laminating two or more thinner electrodes (COL 14, lines 27-30). *Thus, not only Chu at once envisages laminating two or more layers, but Chu also provides specific guidance for forming more than one electrode layer as instantly claimed. Thus, Chu's teachings at least do encompass forming a first stack comprising more than one electrode layer regardless of the specific step order.*

Chu disclose a method of making a battery electrode as described above. However, Chu fails to expressly disclose the specific order of forming (layering) the second layer; producing a second stack of cathode layers (claim 77) and the specific order of blending order (claim 78).

However, in light of Chu's teachings, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to perform the specific order of forming (layering) the second layer because Chu itself discloses that the exact ordering in which components are added is not critical to the invention. In fact, as illustrated in EXAMPLES 1-20, various approaches have been found to work with his invention (COL 12, lines 50-61). Chu further discloses that components may be added to the slurry sequentially or in a premixed form (COL 12, lines 50-61). Therefore, even though Chu does not expressly disclose

the specific order of forming (layering) the second layer or blending order (as recited in claim 78), Chu directly exemplifies and shows that various approaches of adding components to form an electrode active material have also been found to work. Thus, Chu's teachings provide a clear instruction to those of ordinary skill in the art that changing or altering the order of adding components to form electrode active material layers can be easily performed without critically affecting the electrode active material structure or composition, thereby, it is well within the level of ordinary skill, and consequently, it is prima-facie obvious to do so. *Concerning this matter, it is also noted that change in sequence of adding ingredients has been held to render a prima facie case of obviousness, consequently, it is still contended that reversing the order of the prior art process steps (Ex parte Rubin 128 USPQ 440); selection of any order of performing process steps (In re Burhans 69 USPQ 330); or selection of any order of mixing ingredients (In re Gibson 5USPQ 230) are prima facie obvious in the absence of new or unexpected results* ***(See MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale: IV. Changes in Sequence of Adding Ingredients).***

As to the producing a second stack of cathode layers (claim 77), it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to produce a second stack of cathode layers by using the method disclosed by Chu because it has been held that re-arrangement, reversal or duplication of parts is obvious. Succinctly stated, fact that a claimed second stack of cathode layers is structurally re-arranged, reversed or duplicated is not sufficient by itself to patentably distinguish over an otherwise old feature unless there are new or unexpected results as it is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular

configuration of the claimed second stack of cathode layers was significant. In re Japikse 86 USPQ 70. In re Kuhle 188 USPQ 7. In re Gazda 104 USPQ 400. In re Harza 124 USPQ 378. (***Refer to MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale: VI. Reversal, Duplication, OR Rearrangement of Parts***).

Response to Arguments

17. Applicant's arguments filed 03/16/07 have been fully considered but they are still unpersuasive.

18. Applicant's arguments with respect to claim 53, 58-59, 63-64 and 76 have been considered but are moot in view of the new ground(s) of rejection. Refer to item 5 above, rejection based on inherency under Section 102/103.

19. The amendments made to the claims (including claims 76 and new claims 77-79) reflect miscellaneous or cosmetic changes to further clarify or emphasize steps recited in rejected dependent claims 57, 65 or 73. Those steps were fully addressed in the prior office action dated 12/18/06.

20. For the reasons of record, applicant has failed to address the criticality of both the double-sided design and performing two pre-blending steps rather than a single blending step. With particular respect to the double-sided design, the only argument advanced by the applicant is that "*the cathodes of Chu are all single-sided and do not lend themselves, or suggest in any way a double-sided design*". However, this assertion is still insufficient to overcome the prima-facie base of obviousness set forth above which specifically address why is so-obvious to duplicate and re-arrange a part in view of prior legal decisions (settled law: *In re Harza, 274 F.2d 669,*

124 USPQ 378 (CCPA 1960) & In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)). As to the pre-blending steps, applicant has raised that pre-blending is significant because it "*enhances contact between the electrodes material and the conductive aid to provide enhanced electro-chemical performance*". In the first place, the examiner points out that independent claim 79, as now presented, already obviates applicant's enhancement because items (d) and (e) thereof exclude the conductive aid as part of the cathode mixture. Therefore, the conductive aid is not in contact with the electrode active material. That is to say, first and second cathode layers of claim 79 include only the first/second electrode active material and the first/second binder. Thus, no electrochemical performance or contact does occur because the conductive aid is absent from the specific cathode mixture. This appears to have been an editorial error from the applicant. However, this is not the main reason why the enhancement assertion is not sufficient to overcome the prima-facie base of obviousness set forth above which specifically address why is so-obvious to change sequence of adding ingredients in view of prior legal decisions (settled law: *Ex parte Rubin , 128 USPQ 440 (Bd. App. 1959); In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) & In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930)*).

MPEP 2144 [R-5] Sources of Rationale Supporting a Rejection Under 35 U.S.C. 103 states the following: "*The value of the exceedingly large body of precedent wherein our predecessor courts and this court have applied the law of obviousness to particular facts, is that there has been built a wide spectrum of illustrations and accompanying reasoning, that have been melded into a fairly consistent application of law to a great variety of facts." In re Eli Lilly & Co., 902 F.2d 943, 14 USPQ2d 1741 (Fed. Cir. 1990).*"

21. Applicant is reminded that the United States Patent and Trademark Office (Office) in administering the Patent Laws makes many decisions of a substantive nature which the applicant may feel deny him or her the patent protection to which he or she is entitled. The differences of opinion on such matters can be justly resolved only by prescribing and following judicial procedures. Where the differences of opinion concern the denial of patent claims because of prior art or other patentability issues, the questions thereby raised are said to relate to the merits, and appeal procedure within the Office and to the courts has long been provided by statute (35 U.S.C. 134). Under 37 CFR 41.31(a)(1), an applicant for a patent dissatisfied with the primary examiner's decision in the second rejection of his or her claims may appeal to the Board for review of the examiner's rejection by filing a notice of appeal and the required fee set forth in 37 CFR 41.20(b)(1) within the time period provided under 37 CFR 1.134 and 1.136. A notice of appeal may be filed after any of the claims has been twice rejected, regardless of whether the claim(s) has/have been finally rejected. Currently, applicant's claims have been at least twice rejected; and certainly, applicant has the right to become an appellant. More than enough have been said.

22. Applicant's main contention is centered on the assertion that "*Chu does not disclose or suggest layering a first cathode layer that includes no substrate with a second cathode layer that includes no substrate. Chu states that two or more electrodes can be laminated to provide a thicker electrode, but Chu's electrode include a current collector.*" In reply, the examiner contests that applicant is amply mischaracterizing the teachings of the prior art, and even more, assigning specific meanings and/or functions to the features disclosed therein. The examiner has already gone the distance explaining the construction and embodiment of Chu's cathode

laminated structure. The examiner has discussed at length the teachings of Chu in the prior office action (See item 20 below). Applicant's characterization of Chu's teachings is incorrect because applicant is equating his substrate to Chu's current collector. In short, Chu's current collector are not the same as applicant's substrate. Simply put, Chu clearly names **both** a substrate and a current collector, and yet further, Chu clearly differentiates a substrate from a current collector. Applicant is assigning new names or new functions to the elements shown by Chu. In other words, applicant is renaming Chu's feature or elements. That is simply the case here.

Any attempt to deviate or misconstrue the meaning or name given to a feature/element in the context of an embodiment or example or teaching of a reference simply diminishes or invalidates what is instantly disclosed by said reference. In that aspect, the examiner does not promote this, and makes no further comments about it.

The examiner wishes to add the following for emphasis only. Chu's cathode layers or cathode stack structure is/are free of substrate(s). Applicant has misidentified Chu's current collector as a substrate. In the context of Chu, a substrate differs from a current collector because they both carry distinct functionalities or have different uses. Consequently, the teachings of Chu satisfy the claimed requirement of having no substrate.

23. As best understood, applicant has advanced the following statement in support of the patentability of the present claims:

"*This statement says that two or more thinner electrodes can be combined to form a thicker electrode. But the thinner electrodes referred to by Chu are not simply layers of a cathode material. Rather, each thinner electrode is the final product including both a layer of a cathode material and a current collector. This is much different from the method covered by*

claim 76, which requires first layering at least two cathode layers that lack a substrate, such as a current collector, and then bonding a current collector to the resulting stack. This sequence is not disclosed or suggested by Chu."

The examiner replies that the present claims, as now amended, do not exclude to have multiple layers of a combination of cathode material and a current collector together. Present claims simply recite that the both the first and second cathode layers do not include a substrate. However, within the context of that specific inventive embodiment of Chu, the teachings of Chu clearly differentiate a substrate from a current collector. Therefore, applicant's statement that "*This is much different from the method covered by claim 76, which requires first layering at least two cathode layers that lack a substrate, such as a current collector...*" in an attempt to equate Chu's current collector to applicant's substrate is incorrect and not accurate. This is especially true in view of Chu's distinction between a substrate and a current collector within the context of that specific inventive embodiment of Chu.

Certainly, it can be appreciated that Chu does not identify, call or label a substrate as a current collector, or vice-versa. Chu makes it clear that when a substrate is removed or peeled away from the active material, a current collector (that is, another feature) should also be used. Therefore, in that specific inventive embodiment of Chu, a substrate is not a current collector, or a current collector is not a substrate. Since applicant's invention excludes only the substrate but not current collectors in the cathode layers, Chu's invention still reads on applicant's invention. Stated alternatively, Chu contemplates the lamination of a first cathode including first cathode active material and a first current collector (i.e. CAM1-CC1) and a second cathode including a second cathode active material and a second current collector (i.e. CAM2-CC2). Such a

lamination results in a stacked cathode structure including a stack of (CAM1-CC1 and CAM2-CC2)$_1$ and at least one current collector bonded to the cathode stack. Thus, it does satisfy the claimed requirement because Chu's laminated cathode structure does not have a substrate as well as because the present claims fail to exclude more than one current collector.

Alternatively, an additional lamination further results in another stacked cathode structure including a stack of (CAM3-CC3 and CAM4-CC4)$_2$. Thereafter, the combination of (CAM1-CC1 and CAM2-CC2)$_1$ with (CAM3-CC3 and CAM4-CC4)$_2$ also meet applicant's limitation of "*bonding a current collector to the cathode stack to provide the electrode*". Thus, it does satisfy the claimed requirement because Chu's laminated cathode structure does not have a substrate as well as because the present claims fail to exclude more current collector. It is also believed that this alternative fully encompasses the limitation of "*bonding cathode stacks to two sides of a current collector*" as recited in claim 65.

24. Applicant has also advanced that "*Chu also does not disclose or suggest leaving a residual solvent in the cathode layer when the removable substrate is removed...*". In response, it is contended that Chu discloses that preferred liquid solvents evaporate so that the resulting film dries completely and before the redistribution of the components can occur (COL 12, lines 25-30). Thus, Chu's teachings encompass removing a portion of the solvent. It is also contended that a neglectable amount of Chu's solvent may still be present in the cathode layer once the substrate is removed; and such a neglectable amount of Chu's solvent still reads on applicant's claim language broadly requiring to "*remove only a portion of the solvent*". Unless applicant clearly specifies the particular amount of solvent removed from the cathode mixture, it is believed that Chu's invention fully meets the requirement of applicant's claim 55 and 57.

25. Applicant has argued that "Chu does not describe making cathodes from multiple layers of a cathode mixture. Moreover, in any event, Chu does not teach any benefit to using a removable substrate that would motivate a person of ordinary skill in the art to use a removable substrate in connection with making a cathode including multiple layers of cathode active material". In response, the examiner respectfully but strenuously disagrees with applicant's position. In fact, it is positively averred that Chu makes known that it should be noted that electrodes of appropriate thickness for low power application may be made by laminating two or more thinner electrodes (COL 14, lines 27-30). Thus, not only Chu at once envisages laminating two or more layers, but Chu also provides specific guidance for forming more than one electrode layer as instantly claimed and within the scope of applicant's inventive method. Thus, Chu's teachings at least do encompass forming a first stack comprising more than one electrode layer regardless of the specific step order.

26. On the other hand, assuming for the sake of argument that applicant is not convinced that Chu shows the specific order of removing the substrate and then layering the second layer (a point clearly not conceded by the examiner), it is contended that Chu directly exemplifies and shows that various approaches of adding components to form an electrode active material have also been found to work. Specifically, Chu discloses that the exact ordering in which components are added is not critical to the invention. In fact, as illustrated in EXAMPLES 1-20, various approaches have been found to work with his invention (COL 12, lines 50-61); and Chu further discloses that components may be added to the slurry sequentially or in a premixed form (COL 12, lines 50-61). As a consequence, Chu's teachings provide a clear instruction to those of ordinary skill in the art that changing or altering the order of adding components to form

electrode active material layers can be easily performed without critically affecting the electrode active material structure or composition, thereby, it is well within the level of ordinary skill, and consequently, if such a teaching is found not to be fully anticipatory, it does at least set forth a reasonable ground for a prima-facie case of obviousness as also presented supra. *Further concerning this matter, it is also noted that change in sequence of adding ingredients has been held to render a prima facie case of obviousness, consequently, it is still contended that reversing the order of the prior art process steps (Ex parte Rubin 128 USPQ 440); selection of any order of performing process steps (In re Burhans 69 USPQ 330); or selection of any order of mixing ingredients (In re Gibson 5USPQ 230) are prima facie obvious in the absence of new or unexpected results* ***(See MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale: IV. Changes in Sequence of Adding Ingredients)***.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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